

## REMARKS

No amendment has been made in response to the outstanding Final Office Action dated May 27, 2010. The Examiner's reconsideration is respectfully requested in view of the following remarks.

Claims 1-12, 29, 38 and 41 have previously been cancelled.

Claims 13-28, 30-37, 39 and 40 are pending in the present application for reconsideration by the Examiner upon entry of the present Response.

### **Claim Rejections Under 35 U.S.C. § 102**

Claims 13, 15, and 20 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Schwartzwald et al. (U.S. Patent No. 3,090,094; hereinafter, "Schwartzwald").

To anticipate a claim under 35 U.S.C. § 102, a single source must contain all of the elements of the claim. *Lewmar Marine Inc. v. Barient, Inc.*, 827 F.2d 744, 747, 3 U.S.P.Q.2d 1766, 1768 (Fed. Cir. 1987), *cert. denied*, 484 U.S. 1007 (1988). "[a] claim is anticipated only if **each and every element as set forth in the claim** is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. V. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Moreover, "[t]he identical invention must be shown in **as complete detail as is contained** in the ...claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). (Emphasis added)

"An anticipatory reference must show all of the limitations of the claims **arranged or combined in the same way as recited in the claims**, not merely in a particular order." "Thus, it is not enough that the prior art reference discloses part of the claimed invention, which an ordinary artisan might supplement to make the whole, or ..." *Net NoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 88 USPQ2d 1751 (Fed. Cir. 2008) (Emphasis added)

"A holding of no anticipation may be found in instances where the general subject matter is the same but the **specific application or use is different**." *Union Oil Company of California v. Atlantic Richfield Co.*, 208 F.3d 989, 54 USPQ2d 1227 (Fed. Cir. 2000), *cert. denied*, 531 U.S. 1183 (2001) (Emphasis added)

Claim 13 is independent, and Claims 15 and 20 are directly dependent from Claim 13.

Regarding Claim 13, the Examiner has asserted in the Office Action as follows:

SCHWARTZWALDER teaches a method of making porous ceramic articles by impregnating a polymer sponge with a ceramic slurry (col. 3 lines 38-39), dewatering the sponge by removing excess ceramic slurry (col. 3 line 44), and drying the coated sponge (col. 3 lines 44-45) wherein the drying step may be considered a curing step and the product before firing maintains still has the polymer foam in place and is therefore a porous composite.

In this regard, Applicants respectfully disagree with the Examiner's characterization of the prior art.

Claim 13 includes the following limitations:

A method for preparing a porous composite of polymer sponge and ceramic body with excellent thermal insulation property, the method comprising:

an impregnation step in which the polymer sponge having a three-dimensional porous network structure with open cells is immersed in an inorganic adhesive solution, such that the polymer sponge is impregnated with the inorganic adhesive solution;

a dewatering step in which the inorganic adhesive solution is partially removed from the polymer sponge impregnated with the inorganic adhesive solution so as to create pores in the open cells of the three-dimensional porous network structure at an amount selected according to a desired density of the ceramic body, wherein the pores are coated with the inorganic adhesive solution; and

a drying step in which the coated inorganic adhesive solution is dried and cured to form the ceramic body coated in the pores,

wherein the porous composite includes the polymer sponge and the ceramic body coated in the pores of the polymer sponge

(Emphasis added)

As above, Claim 13 includes, as its preamble portion, “for preparing a porous composite of polymer sponge and ceramic body with excellent thermal insulation property.” This preamble portion is also contained in the body portion as “wherein the porous composite includes the polymer sponge and the ceramic body coated in the pores of the polymer sponge.”

That is, the claimed invention is drawn to a porous composite of polymer sponge and ceramic body where the porous composite includes the polymer sponge and the ceramic body coated in the pores of the polymer sponge. The claimed porous composite is useful for thermal insulators and fire-retardant. However, Schwartzwalder is directed to open-celled, porous ceramic structures which are useful as heat-resistant filters for molten metal, as clearly described in lines 11-12 on column 1 thereof.

Thus, it is respectfully submitted that the claimed invention and the prior art have different applications and uses from each other. *Union Oil Company of California v. Atlantic Richfield Co.*, 208 F.3d 989, 54 USPQ2d 1227 (Fed. Cir. 2000), *cert. denied*, 531 U.S. 1183 (2001)

Further, Applicants submit that the preamble portion of Claim 13 be considered limiting since it results in a manipulative difference in the steps or structure of the claim. *Bristol-Myers Squibb Co., v. Ben Venue Labs., Inc.*, 246 F.3d 1368, 58 USPQ2d 1508, 1513 (Fed. Cir. 2001)

Furthermore, Applicants respectfully submit that the preamble portion of Claim 13, which is also defined in the body portion, is to be given patentable weight. "Those limitations appear in the preamble, but are necessary to give meaning to the claim and properly define the invention." *Perkin Elmer Corp. v. Computervision Corp.*, 732 F.2d 888, 221 USPQ 669, 675-76 (Fed. Cir.), *cert. denied*, 469 U.S. 857, 225 USPQ 792 (1984) "The general rule is that a preamble in a claim is not limiting unless an applicant attempts to use the preamble to overcome a rejection." *DeGeorge v. Bernier*, 768 F.2d 1318, 226 USPQ 758, 761 n.3 (Fed. Cir. 1985)

Lines 11-12 on column 1 of Schwartzwalder

**This invention relates to an improved method for 10  
manufacturing open-celled, porous ceramic structures  
which are useful as heat-resistant filters for molten metal,  
as heat-resistant catalyst supports and in other applica-  
tions. The invention has as its principal object the pro-**

Claim 13 includes: “a dewatering step in which the inorganic adhesive solution is partially removed from the polymer sponge impregnated with the inorganic adhesive solution so as to create pores in the open cells of the three-dimensional porous network structure at an amount selected according to a desired density of the ceramic body, wherein the pores are coated with the inorganic adhesive solution.”

Regarding this limitation, the Examiner has stated: “dewatering the sponge by removing excess ceramic slurry (col. 3, line 44).” Applicants respectfully submit that all the elements and limitations of Claim 13 are not considered in the Office Action, and respectfully disagree with the Examiner’s characterization of the claimed subject matter and the prior art.

Schwartzwalder clearly shows “the excess slurry squeezed out” (in line 44 on column 3 thereof) after “while so immersed, was alternately compressed and permitted to expand until the slurry extended completely through the foam” (in lines 38-42 on column 3 thereof). However, the claimed invention is configured such that the inorganic adhesive solution is partially removed ... so as to create pores in the open cells of the three-dimensional porous network structure ... wherein the pores are coated with the inorganic adhesive solution. Therefore, the claimed composite of the polymer sponge and the inorganic adhesive solution remains porous, and the final product also becomes a porous composite.

Lines 38-46 on column 3 of Schwartzwalder

We prepared an aqueous slurry composed, by weight, 35  
of about 67% of 100 mesh and finer zircon powder, 10%  
calcium aluminate, 15% phosphoric acid (75%  $H_3PO_4$ ,  
25%  $H_2O$ ) and 8% additional water. A rectangular slab  
of open-cell polyurethane foam was immersed in this  
slurry and, while so immersed, was alternately compressed 40  
and permitted to expand until the slurry extended com-  
pletely through the foam. This required approximately  
two minutes. The foam slab was then removed from the  
solution and the excess slurry squeezed out. Next, the  
slab was heated for about two hours at 200° F. to evap- 45  
orate the water, and then it was fired from room tempera-  
ture to approximately 2550° F. and back to room tem-  
perature over an eight-hour period. The resultant rec-  
tangular, open-celled porous ceramic article had excel-  
lent physical strength for use as a high heat-resistant fil- 50  
ter for molten metals.

The Examiner has further asserted: “the product before firing maintains still has the polymer foam in place and is therefore a porous composite.” Applicants respectfully disagree with the Examiner’s characterization of the prior art. In the prior art, the final product will become a porous ceramic filter after firing to remove the foam (see 44-47 on column 3 thereof). There is no reason in the prior art that the product before firing should be porous, in view of “while so immersed, was alternately compressed and permitted to expand until the slurry extended completely through the foam” (See lines 38-42 on column 3 of Schwartzwalder). This is because if an attempt is made to make porous the product before firing, the final ceramic filter (when the foam is removed by firing) will not be functional as the intended porous ceramic filter for molten metals.

Regarding the limitation “a dewatering step in which the inorganic adhesive solution is partially removed from the polymer sponge impregnated with the inorganic adhesive solution so as to create pores in the open cells of the three-dimensional porous network structure at an amount selected according to a desired density of the ceramic body, wherein the pores are coated with the inorganic adhesive solution,” it is respectfully submitted that Schwartzwalder fails to show all of the limitations of the claims **arranged or combined in the same way as recited in the claims**, and has **different applications and uses**.

It is therefore respectfully submitted that Schwartzwalder does not anticipate Applicants’ claimed invention since it does not contain *each and every limitations as set forth* in Claim 13, and its *specific application or use* is different from the claimed invention.

Claim 15 and 20 are also believed not anticipated by Schwartzwalder, by virtue of their direct dependency from Claim 13.

Applicants respectfully request the Examiner to review these submissions and withdraw the rejection of Claims 13, 15 and 20 under 35 U.S.C. §102(b).

**Claim Rejections Under 35 U.S.C. §103**

Rejection of Claims 14, 16, 19, 21-24, 27, 28, 30-33, 36, 37, 39 and 40

Claims 14, 16, 19, 21-24, 27, 28, 30-33, 36, 37, 39 and 40 stand rejected under 35 U.S.C. §103(a) as being allegedly unpatentable over Schwartzwalder in view of Bhaduri (Science and Technology of Ceramic Foams).

Claims 14, 16, 19, 21-24, 27, 28, 30-33, 36, 37, 39 and 40 are directly or indirectly dependent from Claim 13.

For an obviousness rejection to be proper, the Examiner is expected to meet the burden of establishing why the differences between the prior art and that claimed would have been obvious. (MPEP 2141(III)) “A patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art.” To find obviousness, the Examiner must “identify a reason that would have prompted a person of ordinary skill in the art in the relevant field to combine the elements in the way the claimed new invention does.” *KSR International Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1741 (2007)

As discussed above in connection with the 102 rejection, Schwartzwalder fails to teach *each and every limitation as set forth* in Claim 13, and its *specific application or use* is different from that subject matter of Claim 13.

Thus, Applicants respectfully submit that, in view of the above discussions, there is no reason for Schwartzwalder to be modified or combined into other prior art references to reach the claimed invention. To reach the claimed invention, Schwartzwalder is to be significantly changed or redesigned in the configurations and functions thereof, and also lose its original purposes and operational principles intended therein. MPEP 2143.01; *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984) As discussed above in connection with the 102 rejection, in case where the Schwartzwalder’s process is modified to be the claimed invention, the final ceramic filter (when the foam is removed by firing) will not be functional as the intended porous

ceramic filter for molten metals, for example, the final product will have difficulties in sustaining its own shape to filter a high-temperature molten metals.

It is therefore respectfully submitted that *prime facie* obviousness does not exist in the proposed combination of Schwartzwalder and Bhaduri with respect to Claim 13, and thus Claim 13 is allowable over the cited references.

Claims 14, 16, 19, 21-24, 27, 28, 30-33, 36, 37, 39 and 40 are also believed to be allowable, by virtue of their direct or indirect dependency from Claim 13.

Applicants respectfully request the Examiner to review these submissions and withdraw the rejection of the claims under 35 U.S.C. §103(a).

#### Rejection of Claims 18, 26 and 35

Claims 18, 26 and 35 stand rejected under 35 U.S.C. §103(a) as being allegedly unpatentable over Schwartzwalder in view of Bhaduri, and further in view of Gill (Environmentally Safe Binders for Agglomeration)

Claims 18, 26 and 35 are directly or indirectly dependent from Claim 13.

The above discussions presented in connection with the 103 rejection apply to Claims 18, 26 and 35, in the same manner. Thus, Applicants respectfully submit that Claim 13 is allowable over Schwartzwalder, Bhaduri and Gill.

Claims 18, 26 and 35 are also believed to be allowable, by virtue of their direct or indirect dependency from Claim 13.

Applicants respectfully request the Examiner to review these submissions and withdraw the rejection of the claims under 35 U.S.C. §103(a).

Rejection of Claims 13, 16, 17, 21, 24, 25, 30, 33, 34, 39 and 40

Claims 13, 16, 17, 21, 24, 25, 30, 33, 34, 39 and 40 stand rejected under 35 U.S.C. §103(a) as being allegedly unpatentable over Chu et al. (Hydroxyapatite implants with designated internal architecture; hereinafter, “Chu”).

Claim 13 is an independent claim. Claims 16, 17, 21, 24, 25, 30, 33, 34, 39 and 40 are directly or indirectly dependent from Claim 13.

Regarding Claim 13, the Examiner has asserted in the Office Action as follows:

CHU teaches a method for preparing a ceramic body wherein the method comprises an impregnation step of an inorganic adhesive solution into a porous structure (fig 1. Suspension casting) and drying the coated porous structure by curing (fig. 1 Suspension curing). CHU is silent to partially removing some of the inorganic adhesive solution in a dewatering step, however, it would have been obvious to one of ordinary skill in the art that the inorganic adhesive of CHU would have been partially removed CHU discloses that the solution flows easily (section 3.2) which would indicate that the solution may have exited the porous structure unintentionally.

Chu is directed to bone and tooth implants and discloses well-defined three-dimensionally interconnected channels with controlled porosity of 26-52%. Chu uses powders and bonders as starting materials and involves “mold and binder removal” and “sintering” processes, as shown in Fig. 1 thereof. Chu’s powder sintering process is basically different from the claimed invention, in terms of their purposes, configurations to achieve those different purposes, and associated results. Applicants argue that a person having ordinary skill looking at Chu would not be tempted to modify or combine Chu with other references to obtain the claimed invention.



Applicants respectfully submit that there is no reason for Chu to be modified or combined into other prior art references to reach the claimed invention. *KSR International Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1741 (2007) Further, Applicants submit, Chu cannot be modified or combined into other prior art references to reach the claimed invention, without significant change or redesign in the configurations and functions thereof, and also without losing the original purposes and operational principles intended in Chu. MPEP 2143.01; *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984); *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959)

It is therefore respectfully submitted that Claim 13 is allowable over Chu. Claims 16, 17, 21, 24, 25, 30, 33, 34, 39 and 40 are also believed to be allowable over the cited reference, by virtue of their direct or indirect dependency from Claim 13.

Applicants respectfully request the Examiner to review these submissions and withdraw this rejection under 35 U.S.C. §103(a).

Rejection of Claims 15, 20, 23, 28, 32 and 37

Claims 15, 20, 23, 28, 32 and 37 stand rejected under 35 U.S.C. §103(a) as being allegedly unpatentable over Chu in view of Bortz et al. (U.S. Patent No. 3,662,405; hereinafter, “Bortz”).

Claims 15, 20, 23, 28, 32 and 37 are directly or indirectly dependent from Claim 13.

As discussed above, Chu cannot be modified or combined into other prior art references to reach the claimed invention, without significant change or redesign in the configurations and functions thereof, and also without losing the original purposes and operational principles intended in Chu. MPEP 2143.01; *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984); *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959) Further, there is no reason to combine Chu into Bortz to reach the claimed invention. *KSR International Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1741 (2007)

It is therefore respectfully submitted that *prime facie* obviousness does not exist in the proposed combination of Chu and Bortz, and thus Claim 13 is allowable over Chu and Bortz.

Claims 15, 20, 23, 28, 32 and 37 are also believed to be allowable over the cited references, by virtue of their direct or indirect dependency from Claim 13.

Applicants respectfully request the Examiner to review these submissions and withdraw this rejection under 35 U.S.C. §103(a).

Rejection of Claims 18, 26 and 35

Claims 18, 26 and 35 stand rejected under 35 U.S.C. §103(a) as being allegedly unpatentable over Chu in view of Gill.

Claims 18, 26 and 35 are directly or indirectly dependent from Claim 13.

As discussed above, Chu cannot be modified or combined into other prior art references to reach the claimed invention, without significant change or redesign in the configurations and functions thereof, and also without losing the original purposes and operational principles intended in Chu. MPEP 2143.01; *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984); *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959) Further, there is no reason to combine Chu into Gill to reach the claimed invention. *KSR International Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1741 (2007)

It is therefore respectfully submitted that *prime facie* obviousness does not exist in the proposed combination of Chu and Gill, and thus Claim 13 is allowable over Chu and Bortz.

Claims 18, 26 and 35 are also believed to be allowable over the cited references, by virtue of their direct or indirect dependency from Claim 13.

Applicants respectfully request the Examiner to review these submissions and withdraw this rejection under 35 U.S.C. §103(a).

**Conclusion**

In view of the foregoing, it is respectfully submitted that the instant application is in condition for allowance. Reconsideration and subsequent allowance of this application are courteously requested.

If there are any charges due with respect to this Amendment or otherwise, please charge them to Deposit Account No. 06-1130 maintained by Applicants' attorneys.

The Examiner is invited to contact Applicants' Attorneys at the below-listed telephone number with any questions or comments regarding this Response or otherwise concerning the present application.

Respectfully submitted,

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